Limitations :

(a) Cannot assess tourist demand, since is based on the resident population.

(b) Can evaluate information, and assess probable demand, but cannot determine policy (it is a tool to aid decision-making).

(c) Cannot assess demand for facilities based on natural resources (mountains, water, air) since these are of necessity determined by the resource location.

(d) Needs much care in data assembly from existing facilities if it is to prove reliable.

Sports facilities management and operational considerations

A. Outdoor Sports and Recreation

Natural facility-based can be divided broadly into two main categories, natural-facility based and outdoor built environment. Natural facility-based outdoor recreation may be subdivided into :

1. Land-based sports and recreation: hill-walking; mountain climbing; abseiling: orienteering; countryside recreation.
2. Water-based sports and recreation-canoeing; sailing; windsurfing; water-skiing (inland and marine).
3. Air-based sports and recreation : gliding; parachuting; hang-gliding.

Generally these require minimal infrastructure (huts, shelters, jetties) but still can have significant environmental impact which need to be skilfully managed.

Built facility-based which covers man-made sports and recreational facilities erected in a variety of outdoor environments like golf courses, sports pitches, artificial ski slopes, ski centres. Some can have substantial environmental impact, both physical and visual – e.g. ski slopes, ski runs, chairlifts.

These large facilities draw people from a wide catchment area, which increases impact –

cars, people, noise, litter etc. that needs to be carefully managed.

Main management challenges

1. **Outdoor safety** : Outdoor safety is important in all cases, but particularly acute in potentially hazardous areas such as mountaineering, winter sports, water-based recreation and air-based sports.
2. **Environmental impact** : A major concern for management.

B. Indoor Sports and Recreation

The present era of sports building provision possibly started in sixties. Prior to that local authorities had assumed that all sport was played out of doors, so that there was no need for indoor facilities (apart from swimming pools).The modern indoor sports complex/hall is therefore a relatively recent phenomenon.

'Dryside' provision : A distinction has long been made in indoor sports and recreation management between 'wetside' (i.e., swimming pool management) and 'dryside' (sports hall management). Both often co-exist in multi-purpose sports and leisure centres or fitness centres, but they have very different management requirements. 'Dryside' facilities include sports halls, multi-purpose halls, gymnasia, fitness centres, weights rooms, squash courts, projectile halls and other specialised 'dry' facilities.

Sports Halls : Design and Management : As with any facility, design has major implications for both subsequent usage and management. Most sports halls are multi-purpose now a days hence, they therefore have to accommodate a variety of sports, and some degree of compromise is inevitable in most cases. Key issues are as under :

(a) Floor surface characteristics
(b) Walls and ceilings
(c) Lighting
(d) Changing facilities
(e) Equipment storage and changeover

Size and usage—modular approach : A typical 'standard' size small sports hall is approximately 33 m (long) × 18 m (wide) × 7.6 m (height) and can accommodate four badminton courts in parallel. Larger sports halls are multiples of this, up to 12-court size. Badminton courts traditionally have been used as a modular yardstick, because badminton is the most popular indoor sports and has the most demanding requirements in terms of several functional elements namely lighting, roof structure and height, background wall and roof colours (shuttle visibility), and air velocity.

Size and usage—alternative approaches : The 'court-based modular approach' can be overruled when other requirements are needed such as :

(i) Sports that need a larger pitch (handball, hockey, korfball etc.).
(ii) Dedicated extra space (e.g., a sprint chute for indoor athletics).
(iii) Additional spectator seating capacity.
(iv) Where a large hall serves as a regional sports arena.
(v) Where region or national standard play takes place in one or more sports.
(vi) Where non-sports events are put on (multi-purpose halls) that require increased space.
(vii) Suspended track netting can be used to subdivide larger halls.

Floor surface properties: For multi-purpose use, the floor has to combine a number of properties such as 'Person-surface interaction': reasonable resilience, some 'give', relatively slip-resistant, and with appropriate deceleration, and shock-absorbent properties and also 'Ball-surface interaction' – floor must have appropriate rebound resistance, which varies with the sports (e.g., soccer, 25% to 50%, but basketball 50% to 70%).

Durability is one of the key properties for floor surface of indoor sports hall/complex–It must resist abrasion (wheels, blades), fatigue

(no signs of cracking or tearing), impact resistance, spike resistance (artificial turf), and resistance to indentation.

Materials of choice may be :

- Hardwood timber (beech, maple)–strips, blocks
- Timber/resin composition (*e.g.*, 'Granwood')
- Sheet (vinyl, linoleum, rubber, composite)
- *In-situ* polymeric, wet-poured
- Textile (woven fabric, felt, carpet - gymnastics, aerobics, indoor bowls)
- Specialist surfaces (synthetic track materials, synthetic pitches, usually outdoor)

Management implications

(a) Floor surface should be chosen with majority user groups in mind (consider range of usage).

(b) Should minimise risk of injury while maximising opportunities for sports development.

(c) Ease of maintenance, both long-term and regular.

(d) Environmentally stable–not affected by changes in heat or humidity.

(e) Visually attractive (colour, reflectance).

(f) Safety and practicality: hygienic, free from dust and vapour, non-toxic, easy to clean and maintain.

(g) Resistant to spillage and accidental damage.

Other considerations

A. Walls and ceilings : Colour chosen should be neutral, restful—but should also maximise aerial visibility, *e.g.*, of shuttlecocks.

B. Lighting :

- Luminaires should be impact resistance, tamper-proof, and positioned to minimise dazzle or eye-strain.
- Sufficient level of light intensity.
- In new halls, much thought currently being given to maximising use of natural daylight whenever possible.
- In major facilities, provision made for additional lighting for televised events.

C. Ventilation

- Sufficient air changes made to ensure an adequate level of ventilation.
- Air-handling units should be silent.
- They should not produce evident air currents that would affect movement of projectiles.

D. Storage Facilities

- Storage facilities should be sufficient to house equipment used by different groups.
- Suspended storage should be provided at a suitable safe level.

E. Changing Rooms

- Capacity, ease of access, security, showering facilities, wet/dry separation must be sufficient and ensured

Indoor Sports—Squash Courts

The commonest specialised form of provision that a dryside manager is likely to meet. Maple or beech floors, hardened plaster walls (should never be painted), back wall may be glass, overhead viewing/marker gallery. Low ambient temperature is required—ideally 20°C or less in view of the vigorous nature of the game. Also to avoid condensation on walls and floor—danger of slippage—air-handling units should ideally make 4-6 complete air changes per hour.

Management Issues

- User management—Insistence must be on players/customers wearing non-marking soles, and half-sleeved shirts (to avoid body fat deposition on walls).
- Routine maintenance—There should be daily dry-mopping to remove dust, cleaning of glass-backed wall and checks on luminaires.

- Once weekly damp-mopping should be carried out.
- Longer term maintenance: floor-markings, plaster finish, wood flooring. These are usually all contracted out to specialist firms.

Weights Rooms

Four broad categories of user are weight-lifters, powerlifters, bodybuilders and weight trainers.

1. Weightlifters (specialising in the two Olympic lifts—snatch, clean and jerk)
2. Powerlifters (the other category of competitive lifter—squats, bench press and dead lift)
   - Both require heavy free weights and appropriate space
   - Weight mats
   - Reinforced floors
   - They are not usually compatible with bodybuilders and weight trainers
3. Bodybuilders
4. Weight trainers
   - They can use traditional fitness rooms.

Management Issues

- Segregation of weight trainers from weightlifters, powerlifters and possibly some bodybuilders is usually desirable.
- Appropriate facility supervision - greater risk attendance on the use of heavy free weights.
- Guard against physical abuse of equipments.
- Theft of small weights.
- CCTV sometimes used.
- Health and Safety implications are substantial.

Fitness Centres

Fitness centres are generally based on the following types of equipments :

1. Weights stack machines (pulley based, cam-based, electronic resistance machines etc.).
2. Cardiovascular machines (exercise bicycles, rowing machines, treadmills, steppers—aerobic fitness).
3. Light free weights (in some fitness centres) that attract a broader user spectrum, mainly weight trainers (aimed at improving fitness) and some bodybuilders (aimed at improving appearance).
4. Some combine 'dryside' and 'wetside', *e.g.*, 'health suites'.

Management Issues

- Growing area, but a highly competitive market.
- Emphasis placed on personal service to customer.
- Visible staff presence.
- Customer induction–customised user programme.
- Regular supervision–leads to regular attendance, and to progression.
- One-to-one personal training.
- Cleaning–upholstery, floors, mirrors, litter-bins.
- Equipment–seats, cables, chains and controls–safety

Projectile Halls

Some larger sports centres have 'projectile halls' which are designed specifically for 'projectile sports' like cricket practice, archery, golf, rifle and pistol shooting and typically 30 m long × 12 m wide × 5 m high with breeze-block or brick walls, concrete or wooden floors with carpet finish.

Strict safety rules for archery and rifle shooting sports are essential in such larger sports centres. Rifle sports need to be licensed, with bullet catchers to prevent ricochets, and high security provided for weapon storage. This, plus lead vaporisation (requiring extraction

equipment to remove this hazard) has greatly restricted their use and alternative usages include bowls, fencing and martial arts.

'Wetside' Provision

'Wetside' refers to the provision of traditional swimming pools, Leisure pools, Saunas, Jacuzzis and hot tubs, Steam rooms, Turkish baths, Flumes and rapids, Water parks and 'wild water' features, with many combinations of the above.

Popularity of Swimming

Numerous surveys have shown that swimming is the most popular of all physical recreation activities that require purpose-designed facilities as this is equally popular with both sexes and have wide participation age range, from young children to elderly people.

Swimming is very appropriate exercise for overweight or physically disabled, due to water buoyancy supporting the body, relieving strain on joints and also use in physiotherapy, hydrotherapy, cardiac rehabilitation programmes. In many countries swimming is a compulsory subject in school/ college/university PE and sports curricula. Like in the Massachusetts Institute of Technology (MIT) 8 point physical education and swimming test is a general institute requirement (GIR) for all MIT students.

Traditional swimming pool provision

- Rectangular tanks—25 metres, 33 metres, and 50 metres length.
- Variable width—4-lane, 6-lane, 8-lane are typical
- Inner lanes 2 m wide, outermost lanes 2.5 m (to reduce wash from poolside), so a 4-lane pool would be 25 m × 9 m overall.
- Effects of wash can be reduced by the use of anti-wave lanes
- Water temperature typically maintained at 29°C (84°F)
- Air temperature kept 1-2° higher (to retain heat in water, reduce subjective feelings of bather chill, prevent roof truss condensation and corrosion).
- Disinfected by chlorine (now rarely), sodium or calcium hypochlorite (majority), ozone, or ozone + hypochlorite.

Ancillary facilities : In addition to the pool itself, additional facilities to be provided and managed are generally include :

- Changing and pre-cleansing areas (need to be kept scrupulously clean, especially floors) – removal of grime, soap residues and body fats
- Footbaths and showers
- Internal laundry (towels)
- Lifeguarding facilities and equipment
- Management and staff accommodation
- Spectator facilities and refreshment
- Storage – pool chemicals (secure, dry); pool equipments.

Management Issues

(a) Customer safety is a prime and major consideration.

(b) Potential hazards could be drowning, choking, slippage on tiled surfaces, falls, diving accidents.

(c) Quality of lifeguarding must be ensured and must include pool alarm systems and emergency plans.

(d) Infection in changing rooms (verrucae), and in pool itself (water-borne infection, e.g., coliform bacteria).

(e) Sterilisation usually now by automatic dosage regulation of pH, free Cl, dissolved solids, bacterial levels; and 'backwashing'.

(f) Need to take account of 'bather load' (swimmer throughput relative to water volume)

(g) Monitoring and adjustment of water and air temperatures.

Pool water quality : Water quality of the swimming pool is a primary management and user/customer concern, but practical maintenance is often subcontracted to an operating company. But pool management have a legal responsibility nonethless to oversee, test and monitor, and to keep regular records. Public health officer should make regular bacteriological checks.

Jacuzzis and hot tubs : These are popular facilities, but can present health hazard if not kept scrupulously clean and increased risk of bacterial infection due to the following two factors:

(a) Higher operating temperature (98°F—37°C—blood heat) so micro-organisms multiply much more rapidly.

(b) Greatly increased bather load.

Bromine (more active than chlorine) is used as sterilant in Jacuzzis and hot tubs. All bathers must shower before use it and water should be changed frequently, 'balance tank' filters be cleaned.and sterilant levels kept topped up.

Saunas, steam rooms and Turkish baths

- Higher operating temperatures still-dry sauna 90°C—120°C (194°F—248 °F).
- Turkish Baths have slightly lower temperature in spacious, tiled dry hot rooms.
- Variable temperatures—'tepidarium', 'calidarium', 'thermidarium'.
- Russian Steam Baths-tiled permanent rooms (traditional), or individual wooden steam cabinets, or heavy-grade plastic rooms (modern equivalent) with integral steam generators.

All require great attention to cleanliness, scrubbing out, and disinfection at the end of the day's operation and users/customers should be encouraged to shower before use, and to sit on towels.

Management responsibilities : To ensure bather safety, certain categories (stated as under) of user should not use these facilities at all, or should do so with great caution :

(a) People with circulatory or heart disease, or diabetes.

(b) People under the influence of alcohol.

(c) Saunas should be avoided for 1½ hrs after a heavy meal.

(d) Migraine sufferers—it may trigger an attack.

(e) People suffering from excess fluid retention caused by an inability to perspire.

Users/Customers should be advised, by visible notice, of these points. Saunas and steam rooms are not endurance tests. All should be fitted with alarm cords in case of emergency.

Specialist management areas

- Arena and stadium management needs specialist as :
  - Difference here is one of scale
  - Large events require meticulous planning
  - Crowd control, and Health and Safety Management assume much greater significance
  - Automated box offices–for major events
- Specialist facility management national stadia, athletics tracks and velodromes requires knowledge of specialist surfaces and high-level competitive requirements.

4. FACILITY PROGRAMMING AND REQUIREMENTS OF USERS

Aims of Facility Programming (Activity Programming) are :

- To provide an attractive and varied programme of sports activities for users
- To provide equitable access for a wide range of contrasting user groups
- To maximise income and profitability by ensuring that all programmable spaces are utilised cost-effectively
- To enhance the overall leisure experience